

CLAIMS

I claim,

1. A torque measuring device for hydraulic installer for earth anchor, including a torque measuring housing, means provided upon the housing for connecting the high and low hydraulic pressure lines to the installer, first and second transducers, each cooperating with a solid-state, strain-gage sensor, for determining the hydraulic fluid pressure generated in the supply pressure and return lines, respectively, during operation of the device, and for converting the determined pressure to an electrical signal, and an electronic read-out device electrically connected with the torque measuring device, to provide for a calculation and read out for display of the measured torque, whereby the torque generated by the hydraulic installer can be sensed and calibrated to furnish an accurate torque read-out in foot pounds of the amount of torque being applied by the installer when driving an earth anchor into the ground.

2. The torque measuring device for hydraulic installer for earth anchor of claim 1 including a toggle switch operatively associated with the device, within its circuitry, to provide for a read-out of the calculated high and low pressure measurements.

3. The torque measuring device of claim 1 wherein said first transducer senses and measures the high pressure generated in the hydraulic source, said low pressure transducer providing for a read-out for the low fluid pressure generated in the hydraulic pressure lines, means for converting said high and low pressure determinations to electrical signals, means for providing a determination of the signal difference between the high and low pressures detected, and a panel meter provided upon the torque measuring device furnishing an analog read-out in foot pounds of the amount of torque being applied by the installer when driving an earth anchor into the ground.

4. The torque measuring device of claim 3 wherein said signal differencing means includes a potentiometer, provided for calibrating the device to zero when the measurements of the detected pressures are equal.

5. The torque measuring device of claim 4 and including battery means operatively associated with the electrical circuitry to provide the levels of voltage

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| From 1974 to 1978 | From 1979 to 1983 | From 1984 to 1988 | From 1989 to 1993 | From 1994 to 1998 | From 1999 to 2003 | From 2004 to 2008 | From 2009 to 2013 | From 2014 to 2018 | From 2019 to 2023 |
| 1974 | 1979 | 1984 | 1989 | 1994 | 1999 | 2004 | 2009 | 2014 | 2019 |
| 1975 | 1980 | 1985 | 1990 | 1995 | 2000 | 2005 | 2010 | 2015 | 2020 |
| 1976 | 1981 | 1986 | 1991 | 1996 | 2001 | 2006 | 2011 | 2016 | 2021 |
| 1977 | 1982 | 1987 | 1992 | 1997 | 2002 | 2007 | 2012 | 2017 | 2022 |
| 1978 | 1983 | 1988 | 1993 | 1998 | 2003 | 2008 | 2013 | 2018 | 2023 |
| 1979 | 1984 | 1989 | 1994 | 1999 | 2004 | 2009 | 2014 | 2019 | 2024 |
| 1980 | 1985 | 1990 | 1995 | 2000 | 2005 | 2010 | 2015 | 2020 | 2025 |
| 1981 | 1986 | 1991 | 1996 | 2001 | 2006 | 2011 | 2016 | 2021 | 2026 |
| 1982 | 1987 | 1992 | 1997 | 2002 | 2007 | 2012 | 2017 | 2022 | 2027 |
| 1983 | 1988 | 1993 | 1998 | 2003 | 2008 | 2013 | 2018 | 2023 | 2028 |
| 1984 | 1989 | 1994 | 1999 | 2004 | 2009 | 2014 | 2019 | 2024 | 2029 |
| 1985 | 1990 | 1995 | 2000 | 2005 | 2010 | 2015 | 2020 | 2025 | 2030 |
| 1986 | 1991 | 1996 | 2001 | 2006 | 2011 | 2016 | 2021 | 2026 | 2031 |
| 1987 | 1992 | 1997 | 2002 | 2007 | 2012 | 2017 | 2022 | 2027 | 2032 |
| 1988 | 1993 | 1998 | 2003 | 2008 | 2013 | 2018 | 2023 | 2028 | 2033 |
| 1989 | 1994 | 1999 | 2004 | 2009 | 2014 | 2019 | 2024 | 2029 | 2034 |
| 1990 | 1995 | 2000 | 2005 | 2010 | 2015 | 2020 | 2025 | 2030 | 2035 |
| 1991 | 1996 | 2001 | 2006 | 2011 | 2016 | 2021 | 2026 | 2031 | 2036 |
| 1992 | 1997 | 2002 | 2007 | 2012 | 2017 | 2022 | 2027 | 2032 | 2037 |
| 1993 | 1998 | 2003 | 2008 | 2013 | 2018 | 2023 | 2028 | 2033 | 2038 |
| 1994 | 1999 | 2004 | 2009 | 2014 | 2019 | 2024 | 2029 | 2034 | 2039 |
| 1995 | 2000 | 2005 | 2010 | 2015 | 2020 | 2025 | 2030 | 2035 | 2040 |
| 1996 | 2001 | 2006 | 2011 | 2016 | 2021 | 2026 | 2031 | 2036 | 2041 |
| 1997 | 2002 | 2007 | 2012 | 2017 | 2022 | 2027 | 2032 | 2037 | 2042 |
| 1998 | 2003 | 2008 | 2013 | 2018 | 2023 | 2028 | 2033 | 2038 | 2043 |
| 1999 | 2004 | 2009 | 2014 | 2019 | 2024 | 2029 | 2034 | 2039 | 2044 |
| 2000 | 2005 | 2010 | 2015 | 2020 | 2025 | 2030 | 2035 | 2040 | 2045 |
| 2001 | 2006 | 2011 | 2016 | 2021 | 2026 | 2031 | 2036 | 2041 | 2046 |
| 2002 | 2007 | 2012 | 2017 | 2022 | 2027 | 2032 | 2037 | 2042 | 2047 |
| 2003 | 2008 | 2013 | 2018 | 2023 | 2028 | 2033 | 2038 | 2043 | 2048 |
| 2004 | 2009 | 2014 | 2019 | 2024 | 2029 | 2034 | 2039 | 2044 | 2049 |
| 2005 | 2010 | 2015 | 2020 | 2025 | 2030 | 2035 | 2040 | 2045 | 2050 |
| 2006 | 2011 | 2016 | 2021 | 2026 | 2031 | 2036 | 2041 | 2046 | 2051 |
| 2007 | 2012 | 2017 | 2022 | 2027 | 2032 | 2037 | 2042 | 2047 | 2052 |
| 2008 | 2013 | 2018 | 2023 | 2028 | 2033 | 2038 | 2043 | 2048 | 2053 |
| 2009 | 2014 | 2019 | 2024 | 2029 | 2034 | 2039 | 2044 | 2049 | 2054 |
| 2010 | 2015 | 2020 | 2025 | 2030 | | | | | |